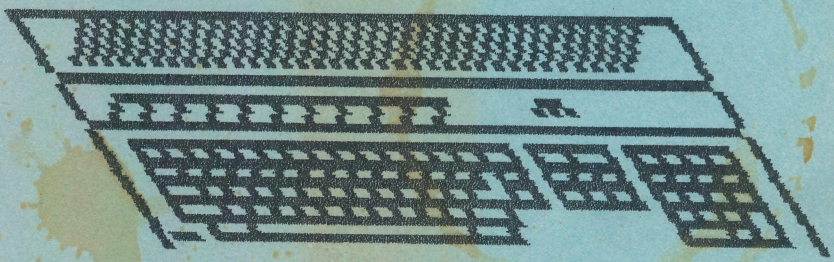
STUN

ST USERS NETWORK

ATARI ST



STUN
P.O. BOX 27285
Salt Lake City, Utah 84127-0285

Bulk Rate
U.S. Postage
PAID
MIDVALE UTAH
PERMIT NO. 628

AUG-87 C

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2818 W. 5825 S.
ROY, UTAH 84067

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STUN MEMBERSHIP

1st Year $25.00 Reneual $20.00

ADVERTIZING RATES

Back Cover $40.00
Inside Cover (Either) $30.00
Center Two Page Spread $50.00
Full Page $20.00
Half Page $15.00
Quarter Page $10.00
Business Card $7.00

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STUN Meetings are held The Third Wendsday of each month at Murray High School. (6440 South State)

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Anees Munshi. April 14, 1986.

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EDITOR'S PAGE

OK!
So we have a new slate of officers, what has that got to do with anything? Well. I met with all of them the other night and it has a lot to do with how I, at least , feel about the club, and by inference, my computer.

It seemed like we were going to have a default staff of officers at first but it didn't work out that way. Even though the nominations were somewhat shallow, the elected officers are not.

Randy's act is going to be hard to follow, what with his lack of temper and obvious interest in each of us. Jim Hepworth though has an essence of his own. (no I'm not talking about BO) He is, so far, unflappable, and willing to take everything in before jumping to any conclusions. I think, given this attitude, his ability to do well is up to us. So far he is much like a good surgeon, very capable but unwilling to operate on a dead body.

So!
Let's show the *life* that we have and let him know that the efforts he puts out are to a good purpose.

The buck doesn't stop there. The whole staff is working for us and this is a club not a government so lets go to work for them.

As I was writing this an onlooker put her hand on my shoulder and said don't ask someone to do... cause what you have left out means nothing, so ask them to do something.

Ya. She's right.

As for the Pres. and Vice Pres. I can't say, but for me, I would like some help with the articles. The articles section of both ASTUN and HOG reads Ralph Porter, Brad Davis and empty. If you see or hear something interesting type it up and upload it please.

Also I am very thick skinned, let me hear from you good or bad.

THUNDERPEN

PRESIDENT'S PAGE

First I have to say I'm very honored to have been selected for this position. I'm also glad that you selected such fine people as my officers. We are all going to work very hard to keep this club running like you want it.

At this time I'd like to thank the previous years officers and congradulate them on doing a great job the past year. I hope we can do as fine a job as has been done in the past.

Now let me give you a quicky of my background. I first started into computers back when I was in High School. From there I got a position as a computer operator. Two years later I changed jobs and became programmer for a small company and within 2 years was Data Processing Manager. Most of my background is in the retail side of business.

My first home computer was a Hewlett Packard 86A. It wasn't a very good home computer and I only used it for wordprocessing. I soon sold that machine and invested my money into an Atari 1040ST. That was a year and a half ago and I've never been sorry that I chose this machine.

Since I bought my Atari I've added a second floppy drive, a 2400 baud modem, a toshiba printer, an 87 megabyte hard disk drive and a lot of software. My primary language is still Basic but I'm trying to learn MegaMax C in my spare time.

Currently I use my Atari for running a small busines, word processing, database management, spreadsheets, desktop publishing, teaching my children and of course games.

Now enough about me, let's talk about the club. Currently the club owns: 1 Atari 520, 1 monochrome monitor, 1 Atari SF354 drive, 1 Supra 60 megabyte hard disk drive, and FoReM BBS software. We also have a large ST disk library and our club newsletter.

This comming year I hope to expand our clubs enrollement and also add to our hardware library. (Maybe a laser printer for members use.) I also hope to get some more participation from our current members in the form of different software and hardware sigs.

Well, it's time to say goodbye for now but don't forget this months club meeting on November 18th at 7:00 at Murry High School. We are going to have a demo on the fabulous WordPerfect wordprocessor. Don't miss it!

WORDPERFECT FOR THE ATARI ST

REVIEW OF THE WORDPERFECT PROGRAM FOR THE ATARI

BY BOB FREDERICKSON

In this world of inaccurate langauge, for anything to call itself perfect, is on its face, ego on rampage. Still we all must gauge what we use against some standard of excellence, that, if it is not perfect, is close enough for our purpose. In this context I am willing to forgive the WordPerfect people their excess. The product is, of course, not perfect but I have not found the thing that I want it to do that it will not. The rub, as always, is having to obey the rules.

WordPerfect for the Atari is not a purest point and click program like our old favorites and can get very picky about how one enters the commands, or sets the page, though the thing will work without crashing if you do what it says. Even if you do force a crash its timed save backup will have backed up your work and forgiven your stupidity.

The safety factor in the program is nice (if I do something bad it will it save me) but the true judge of a program should be, how well it works when you are going lickety-split through the functions. In this WordPerfect has no peer.

The *list files* and opening of folders coupled with the *look function* (yesVirginia you can look through a file, commands and all from anywhere in the program), makes copying and cross-checking files a breeze.

The spell checker is a little bit better than fantastic, with a very nice split screen arrangement. If you question the list of possibles just wait a while and it will searcch through several more levels. The only glitch is that it makes you wait until it posts all of the first list of options before letting you hit the A-to Z key for auto replace. This is negligeable for a hard drive system but unhandy running with a floppy disk.

The way around it is to get a memory upgrade and then run both speller and thesaurus out of a ram disk, preferably one that copies the files in at boot up. This works well though increases boot time considerably.

The thesaurus is really a bragging point for people who want to be understood in their writing. If you are not satisfied with the first word match just click on any of the replacement words and it will treat it like an original word and list a new selection off of it.

It is refreshing to finally have a program that will support proportional spacing and right hand justification. To have all this and columns to is cream and gravy mixed.

The print drivers in WordPerfect are very accurate in what they do. You can get almost anything that your printer will do right out of the Gem commands and the font changes. There is one form for compressed, another for elongated, all in all there are eight fonts corresponding to the different abilities of you printer, or, wonder of all wonders, your printers [up to four]. The pitch and line spacing are also quite automatic being set from the same Gem command menu.

The never-never land parts of the program (is this really a word processor?), consist of *border draw*, which will draw a border of any character you choose around your work, and keep it there through re-structuring or file copying, and a mini spreadsheet ability to select ranges and to do math and data functions in them.

WordPerfect Corporation claimed right from the start that they were going to be in the integrated software business. WordPerfect for the Atari is another evidence that they are well on their way.

I suspect that with their enthusiasm running at present levels we should see parts of a desk-top publishing and a tele-communication program joining the spread-sheet and data-base functions sometime in the near future.

The only really negative factor in the comparison between the Atari WP and the IBM WP is the lack of the type-through part of the program that let you sit down to your computer-printer and fill out complex forms.

The program comes on five unproected single-sided disks and can be configured almost any way you could think of to do at, though getting through the start up program is a little tough if you get to fancy.

The documentation runs to six hundered 6"x9" pages before the index and glossary. There is also a function key template that fits into place and stays there.

Just in case you haven't grossed out on the rest there is a printable manual for the printer program as well as the speller and spell program. The upshot of all this is to make sure that even if it ain't easy it is most surely doable.

I had kept my poetry and prose along with a great deal of corspondence and two mailing lists on one 840K double sided disk that was chock full. After changing everything over to WP format it all fits very well in to a 420K file on my hard disk. I know that some of the difference is in the files one has to keep on the data disk in First Word but I am sure of a twenty five percent more effecent storage, and this is before they have included the arc shell (promised soon) into the program.

No ! I do not suggest W.P. for every member of the club as the cost is above $350.00 so it will probably be as exclusive as it is in the IBM.

Nonetheless its the best thing to come along so far by a long ways and looks like the W.P.organization will keep it current.

RUMOR MILL

What to expect at COMDEX

BY RALPH PORTER

THE RUMOR MILL

As we all know rumors are often sent out on these boards. The following information should be taken for what you think it is worth. The source of this information is from an article published in InfoWord and notes from NETNEWS, an international computer network. They refer to data published in the British computer press.

If the information is correct we can expect Atari to release within the next year a computer that is truly, placing the power of a mini computer on your desk. It will exceed the throughput of many supermini computers available today.

The design will be based on the inmos T800 Transputer executing 15 mips.

Up to 13 T800's can be fit into the system box.

The T800 is roughly equivalent of the 68020/68881 chip combination.

It has an internal 32 Bit ieee. math co processor. It will run at a clock speed of 20 Mhz. with a 30Mhz. version expected next year.

Internally it supports 4 Kb on chip memory and 4 serial interfaces or links that use DMA cycle stealing to transmit and receive data.

These links can run at up to 20 MegaBits per second.

Multitasking will be standard. This will be accomplished using internal micro coded instructions and context switching.

Graphics will be fast. 13 frames/sec using a 1 million pixtel screen. and will use a 32 bit blitter.

The highest resolution screen will be 1280 x 960 using 4 colors.

Other graphics modes will also be included. The color palette will be selected from an available 16,000,000 colors.

Initially this will be available as an add on box for the current ST computer line and will be followed by a stand alone workstation.

First shipments are expected to be in June at a price under $1600.

Another rumors says a new computer will be based on the Motorola 78000 CPU. This machine should run a unix clone OS developed by DRI. It will have 20 RS232 ports and will include an 80386 coprocessor to provide compatibility with the IBM world. It will have a 1 MEG ROM based operating system and a will dedicate 1 MEG of memory for RAM Buffers. Total addressable Memory is said to be 48 Meg. with a projected release date of 1st April 1988.

The official name for this is the B.S. 3020. Please note the date of release before taking this to seriously.

COMDEX 1987
/ RALPH PORTER

It was a last second spur of the moment decision, that proved to be worth the the effort. The decision to visit for one day, the years Winter Comdex show.

As with all such shows one day can not give it justice and I found that most of my time was spent near the Atari Booth.

Atari was in force and as with other Atari shows the space was taken up mostly by software developers showing their wares.

There were upgrades of many products shown such as MigraphsSuper Charger to allow importing graphics into Easy Draw, and Publishing Partner showing version 2.0 with many enhancements.

There were new word processors, spreadsheets and a lot of CAD programs. Antic was there showing a SONY gem lock system allowing the integration of video and computer technology. I'm sure we will be printing more details about these and the many other new software products shown.

The intent of this column however is to let you know what Atari had to show. First there was a reintroduction of an old product, The CD ROM. This will sell for around $600 and will include Audio Capability as well as its ability to store 540 Megabytes of data on a single CD ROM disk.

The storage capacity of this device is roughly 1000 typical floppy disks or over 200,000 pages of printed material, or thousands of images, or hours of spoken text. As data disks become available this product will interest more and more ST users.

Next the PC Clones. The Atari PC1 was shown again along with its two big brothers, the PC2 and PC4. The PC1 will come with a multi mode Amber Monitor and have a clock speed of 8 Mhz. It will include support for Monochrome, CGA, and EGA Color Display. The maximum screen resolution is 720 x 348. It will come with 512K and is expandable to 640K. It also has a socket for the 8087 Math Co processor. It has one 5 1/4" floppy disk and will support up to 3 disk drives. It will also have a card to support Atari's new NETWORK (PromiseLAN). The LAN will support up to 17 PC's, ST's or Mac's. in a star arrangement..

Future enhancements are to expand this LAN even further. The lan will communicate at 1 Megabits per second. The PC2 has all the features of the PC1 plus 5 XT type internal slots for add on cards, and a real time clock. A second Floppy or hard disk can be internally mounted.

The PC4 will use an 80286 for AT compatibility and will run at 8 and 12 MHZ. It has 4 AT type expansion slots and will accept up to 1 meg of system ram. It has a real time clock and a slot for an 80287 numeric coprocessor. It can use any combination desired of 3 1/2 and 5 1/4" disk drives. All the PC computers have a mouse, a parallel and serial port, and an AT style keyboard.

New for the ST is DeskSet, a comprehensive professional desktop publishing program. It is designed to work with the Laser Printer and an Atari Mega4 Computer. Microsoft Write also made its Official Debut. The Laser printer was their in force, displayed with almost every software program show.

There has been several rumors about an add on processor for the ST. Atari was showing its new ABAQ Transputer, A thirty two bit processor featuring an internal hardware math coprocessor and four K of internal RAM. This product will be available as an add on for the Mega Series (Sorry 520 and 1040 Owners) and as a stand alone workstation. I would expect to see a third party developer provide the hardware interface for the older ST's. I guess time will tell.

The transputer is ran with a 20 Mhz. Clock and will perform at over 10 mips. By adding additional transputer chips 130 mips or about 20 Mflops will be available in a desktop package. It will address up to 64 Meg of internal memory

This machine will excel in 3-D Cad and other graphics environments. It uses a One Megabyte Video RAM, to display up to 1280 x 960 pixtel video in four colors. It can show 1024 x 786 with 256 colors. A two screen 640 x 480 mode is available along with the low resolution mode 512 x 480. In this mode the full 6 Million color pallet may be displayed on screen.

The operating system will be HELIOS, A multi-processor, multi-user that will prove quite familiar to unix users. It will include X-Windows, version 11. It also has a GEM-VDI driver for running GEM under Windows.

Atari stated that this machine will have in excess of ten time the power pf an IBM PC/AT system. They hope this new computer will set a new standard in providing computer soltions previously requiring expensive mainframes, and still be small enough to sit on a desk.

Unlike previous product announcements Atari gave no prices or delivery dates on these products, with the exception of the CD-ROM. I guess they have learned from past experience.

Speculation of the transputer is that it will be around $1600 as a Mega ST add on, or $3000 as a stand alone work station. It appears that Atari may be growing up. Their ability to deliver these products in a timely fashion will tell the story.

CARTRIDGE MODIFICATION

Anees Munshi. April 14, 1986.

_A_b_s_t_r_a_c_t

The Atari ST's 128 Kbyte read-only cartridge port can be transformed into a 64 Kbyte read/write port by using this circuit. Writing to this port is slower than reading it by a factor of two, approximately. It can be written to at a speed of 76 Kilowords per second.

This interface can be built by using only three chips, two AS-TTLs and a PAL -- a total parts cost of less than $15.

_H_o_w__I_t__w_o_r_k_s

1. _B_a_c_k_g_r_o_u_n_d__I_n_f_o_r_m_a_t_i_o_n

The ST brings out 15 address lines (A1-A15), 16 data lines (d0-D15) /LDS,[*] /UDS, /AS, /ROM4 and /ROM3. Of these signals, /UDS, /LDS, and /AS have the same meaning as they as they do for a 68000 CPU. A1-A15 are the least significant 15 address lines. D0-D15 are connected internally to the ST's data-bus. /ROM3 and /ROM4 are generated by the MMU and are output signals which tell the external hardware which of the two banks is being addressed. /ROM4 is activated when the 68000 tries to read address 0xfa0000-0xfaffff. /ROM3 is activated when the 68000 tries to read address 0xfb0000-0xfbffff. (Note that the names of these signals are counterintuitive; ie. they have been correctly written above.)

2. _C_a_v_e_a_t_s

Any and all hardware connected to this modified port must be fast -- fast enough to run with no wait-states and fast enough to tolerate the decoding delays introduced by this circuit. I've used 200ns static RAM chips without any trouble.

It is advisable to use /ROM4 to time any external hardware you build (in preference to /AS), since /ROM4 contains the necessary delay to ensure the addresses are stable when it is activated. (At least this is what I assumed, and it worked.)

The data for write operations is produced by the two AS-TTL latches[*] used in the circuit (see below.)

[*] A preceeding slash indicates an active-low signal

3. _O_p_e_r_a_t_i_n_g__P_r_i_n_c_i_p_l_e

i. The PAL contains an asynchronous finite state machine. When the upper bank (address 0xfbxxxx) is read, the PAL manufactures an A0 (based on the state of /UDS and /LDS) and supplies this to U1. At the end of the read cycle, U1 and U2 are clocked to latch the least significant 16 address bits into the PAL.

ii. Subsequently, when the lower bank is read (address 0xfaxxxx), the latched address (which was latched in step 1)is supplied as data and /PWE (the write-enable signal) is activated (it goes low). /ROM4 active should tell the external hardware that it is being addressed, and /PWE active should tell it that this is a write-cycle. As an interesting side-effect of this design, the data word written out is read back by the 68000 (you can use this fact to debug the interface!)

iii. Reads to the upper bank will return garbage unless some ROM is present there. Multiple successive reads to this bank will not be harmful (ie. they will not confuse the state-machine) and the latest address will be latched preparation for a read to the lower bank.

Note that if you put RAM in the upper-bank you will not be able to write to it. Connecting the /PWE line to such RAM will have no effect. Putting a ROM in this address space should not create any problems (although I haven't tried this).

Example:

To write data 0xcd01 to address 0x3bc0 in the lower bank, the following steps are performed.

step1. read byte at address 0xfbcd01 (0xfb0000+data)
step2. read word to address 0xfa3bc0 (0xfa0000+addr)

[*] I used AS374s, you can use AS or FAST. High speed chips are necessary so that delays from /OE (latch output-enable) to valid data are not critical. You could possibly get away with ALSTTL, but I haven't tried this.

_C_o_n_s_t_r_u_c_t_i_o_n

The schematic should help in this department. Constructing this gadget is easy and cheap. The hardest part might be trying to find a connector for this port. You can get one from

Douglas Electronics,
718 Marina Blvd.,
San Leandro, Calif
94577 1-415-483-8770
(part number 33-DE-40. $10.00 per piece)[*]

Another problem you might face is getting the PAL programmed. If you don't know of a way to get the PAL programmed, you could use discrete logic chips to build the state machine.

4. _B_u_i_l_d_i_n_g__i_t

The pin-outs given in the User's guide are CORRECT. The pin-outs given in the "Internals" book are WRONG. Follow the schematic. You can get the pin-outs for the '374s from an ASTTL or FAST databook. The PAL16L8's pin-outs are given below.

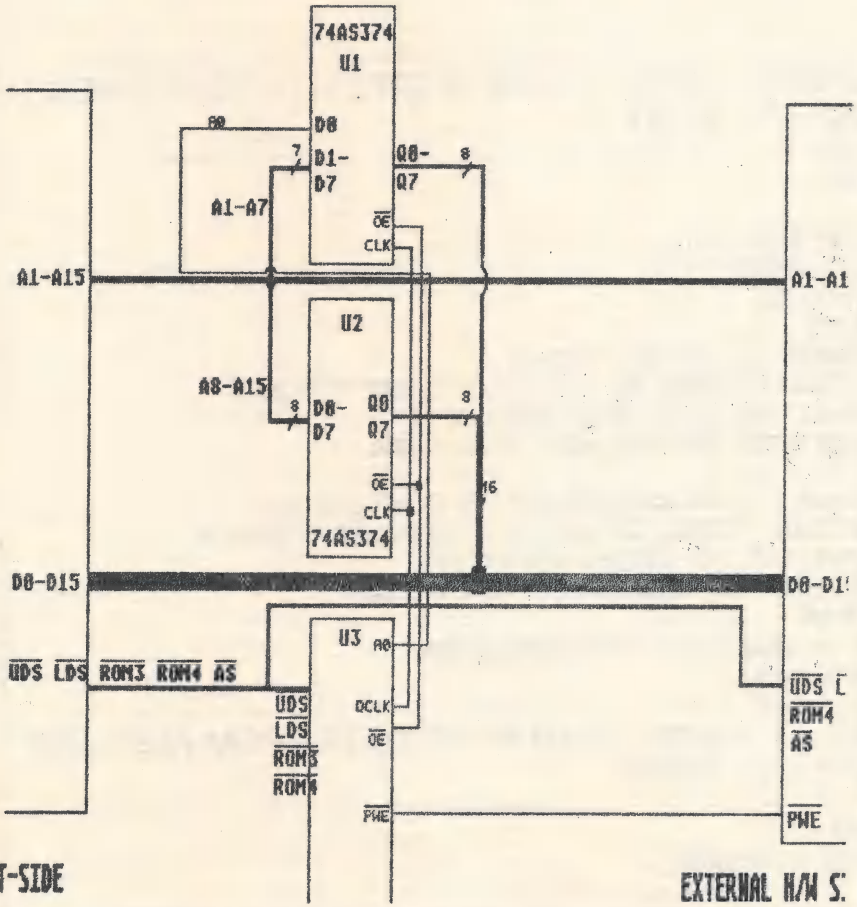
PAL PINOUTS

Legend:

A preceding slash implies an active-low signal.
NC implies no-contact (nothing should be connected to these pins.)
(i) indicates that the signal is an input.
(o) indicates that the signal is an output.
(A) implies that the signal comes from/goes to the Atari cart. port.
(u1) implies that the signal goes to U1, the least-significant latch.
(u2) implies that the signal goes to U2, the most-significant latch.
(ex) implies that the signal goes to any external hardware connected such as a ram-disk.

[*] You guessed it -- I'm not connected with D.E. although I and a number of others have purchased these connectors from them.

pin #	signal	pin #	signal
1	/UDS (i, A)	11	NC (no contact)
2	/LDS (i, A)	12	/OE (o, U1, U2)
3	/ROM4 (i, A)	13	A0 (o, U1)
4	/ROM3 (i, A)	14	/PWE (o, ex)
5	NC	15	NC
6	NC	16	/dclk (o, U1,U2)
7	NC	17	NC
8	NC	18	NC
9	NC	19	NC
10	gnd (A)	20	Vcc (A)



CARTRAGE PROGRAM

```
/module name  CART.S %W% of %G%
/
/contains:
/writecart 16 : write word to cartridge port.
/writecart 8  : write byte to cartridge port.
/readcart  16 : read word from cartridge port.
/fillmem      : fill shared memory with a pattern.
/
.prvd


/---------------------------------------------------------------------
/WRITECART16: WRITE 16 BIT DATA TO ADDRESS ON CART PORT
/---------------------------------------------------------------------
.shri

.globl writecart16_
writecart16_:
linka6, $0
clr.ld0
move10(a6), d0/ fetch data to write
addi.l$0xFB0000, d0/ add it to base addr of ROM 3
movea.l d0, a0/ generate addr1 (say)
move.b(a0), d0/ read addr1 to latch data.
clr.ld0
move8(a6), d0/ now take address to write data to
addi.l$0xFA0000, d0/ add this to base addr of ROM 4
movea.l d0, a0/ call this addr2 (say).
move(a0), d0/ read addr2 to write out data
unlka6
rts/ as side-effect, same data will be
/ returned!
/---------------------------------------------------------------------
/READCART16: READ 16 BIT DATA FROM ADDRESS ON CART PORT
/---------------------------------------------------------------------
.shri
.globl readcart16_
```

```
readcart16_:
linka6, $0
clr.ld0

move8(a6), d0/ fetch address to read from
addi.l$0xFA0000, d0/ add it to base addr of ROM 4
movea.l d0, a0/ generate addr1 (say)
move(a0), d0/ read addr1 to latch data.
unlka6
rts/ as side-effect, same data will be
/ returned!
/-----------------------------------------------------------------
/WRITECART8: WRITE 8 BIT DATA TO ADDRESS
ON CART PORT
/-----------------------------------------------------------------
.shri
/
/writecart8(addr, data)
/int addr, data
/
.globl writecart8_
writecart8_:
linka6, $0
clr.ld0
move8(a6), d0/ fetch address
and$0xFFFE, d0/ and with 0xFFFE to evenify
move.ld0, d1
cmp.w8(a6), d0
beqevn
odd:/ this is write byte to odd address
move.wd0, 8(a6)
addi.l$0xFA0000, d1/ generate real even address
movea.ld1, a0
move.w(a0), d0/ fetch word
andi.w$0xFF00, d0/ null odd byte of this word
move.w10(a6), d1
andi.w$0x00FF, d1/ null even byte of data
or.wd1, d0/ merge together
moved0, -(a7)
move8(a6), -(a7)/ and write to even address
jsrwritecart16_
addq.l$4, a7
unlka6
rts
evn:/ even address continue here
```

```
move.wd0, 8(a6)
addi.l$0xFA0000, d1/ generate real even address
movea.ld1, a0
move.w(a0), d0

andi.w$0x00FF, d0
move.w10(a6), d1
asl.w$8, d1
andi.w$0xFF00, d1
ord1, d0
moved0, -(a7)
move8(a6), -(a7)
jsrwritecart16_
addq.l$4, a7
unlka6
rts
/-------------------------------------------------------------------
/FILLMEM : FILL SHARED RAM WITH A PATTERN
/-------------------------------------------------------------------
.shri
.globl fillmem_
fillmem_:
linka6, $0
move8(a6), d1/ this is the fill pattern (a 16 bit word)
clr.ld0/ start filling from addr 0 offset from
/ 0xFA0000
floop:moved1, -(a7)/ push data (fill pattern) on stack
moved0, -(a7)/ push address on stack
jsrwritecart16_/ write fill pattern
move(a7)+, d0
move(a7)+, d1/ pop stack
addq.l$2, d0/ increment address
cmp$0x1000, d0/ is it the end of the 2K word memory
bgefdone
brafloop
fdone:
unlka6
rts
/-------------------------------------------------------------------
/RUN320:TAKE TMS32010 OUT OF RESET MODE
/-------------------------------------------------------------------
.shri
.globl run320q_
run320q_:
linka6, $0
movea.l$0xFA1000, a0/ address of the control register
```

```
move.w(a0), d0/ fetch contents of control register
andi.w  $0x00FF, d0/ mask off contents of 320 port 1
ori.w$0x0001, d0/ force only reset to 1


move.wd0, -(a7)/ push data to write in stack
move.w  $0x1000, -(a7)/ push address offset to write to in stack
jsrwritecart16_
addq.l$4, a7/ remove arguments from stack
movea.l $0xFA0000, a0/ read the control register again
move.w(a0),d0/ keep value in a0 (ie return it)
unlka6
rts
/-----------------------------------------------------------------------
--
/STOP320: PUT TMS32010 IN RESET MODE
/-----------------------------------------------------------------------
--
.shri
.globl stop320_
stop320_:
linka6, $0
movea.l$0xFA1000, a0/ address of the control register
move.w(a0), d0/ fetch contents of control register
andi.w  $0xFFFE, d0/ force reset bit to 0.
move.wd0, -(a7)/ push data to write in stack
move.w  $0x1000, -(a7)/ push address offset to write to in stack
jsrwritecart16_
addq.l$4, a7/ remove arguments from stack
movea.l $0xFA0000, a0/ read the control register again
move.w(a0),d0/ keep value in a0 (ie return it)
unlka6
rts
```

POKE. PAL

```
pal16l8


/uds /lds /rom4 /rom3 nc nc nc nc nc gnd
nc /oe /a0 /pwe /help /dclk nc nc nc vcc


;Version 2. Hopefully with the A0 problem corrected
; PWE is the write-enable. It is called PWE since it represents a


PENDING
; WRITE ENABLE!

pwe = /pwe * rom3 + pwe * rom3 + pwe * /rom3 * /rom4 *
/help +
pwe * rom4

help = rom4 * pwe + help * /rom4 * pwe
a0 = /a0 * rom3 * uds + a0 * /rom4
dclk = rom3 * lds + rom3 * uds
oe = rom4 * pwe

function table
```

ALL THE BEST!!

Anees Munshi. April 14, 1986.

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